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☐ 1. Document ID: US 5987474 A

L1: Entry 1 of 4 File: USPT Nov 16, 1999

US-PAT-NO: 5987474
DOCUMENT-IDENTIFIER: US 5987474 A

TITLE: Computer aided maintenance and repair information system for equipment subject to regulatory compliance

DATE-ISSUED: November 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sandifer; Michael A.	Millbrae	CA	N/A	N/A

US-CL-CURRENT: 707/104; 707/103

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 2. Document ID: US 5778381 A

L1: Entry 2 of 4 File: USPT Jul 7, 1998

US-PAT-NO: 5778381
DOCUMENT-IDENTIFIER: US 5778381 A

TITLE: Computer aided maintenance and repair information system for equipment subject to regulatory compliance

DATE-ISSUED: July 7, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sandifer; Michael A.	Millbrae	CA	N/A	N/A

US-CL-CURRENT: 707/104; 701/29, 701/30, 707/103

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 3. Document ID: US 4688195 A

L1: Entry 3 of 4 File: USPT Aug 18, 1987

US-PAT-NO: 4688195
DOCUMENT-IDENTIFIER: US 4688195 A

TITLE: Natural-language interface generating system

DATE-ISSUED: August 18, 1987

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Thompson; Craig W.	Plano	TX	N/A	N/A
Ross; Kenneth M.	Bedford	TX	N/A	N/A

US-CL-CURRENT: 706/11

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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4. Document ID: US 4170015 A

L1: Entry 4 of 4 File: USPT Oct 2, 1979

US-PAT-NO: 4170015
DOCUMENT-IDENTIFIER: US 4170015 A

TITLE: Time clock device

DATE-ISSUED: October 2, 1979

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Elliano; Jack L.	Sepulveda	CA	91340	N/A
Levin; Michael M.	N. Hollywood	CA	91606	N/A

US-CL-CURRENT: 346/76.1; 346/82, 377/20, 377/26, 705/32

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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Terms	Documents
((job adj1 card$) and (requir$ near3 (maintenance or maintain$)))	4

Display 10 Documents, starting with Document: 4

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L2: Entry 1 of 36 File: USPT Feb 20, 2001

DOCUMENT-IDENTIFIER: US 6189523 B1
TITLE: Method and system for controlling an air-to-fuel ratio in a non-stoichiometric power governed gaseous-fueled stationary internal combustion engine

BSPR:
Regarding known open loop air-fuel ratio control systems, a carburetor is typically used as the air and fuel delivery apparatus. The carburetor, due to the mechanics of the apparatus itself, fixes the ratio of air and fuel. In the open loop approach, the system is adjusted to an air-fuel ratio near the lean power loss/misfire limit. However, during operation, the degree of optimization actually realized varies depending on a variety of factors, such as changes in engine load, changes in relative humidity, changes in fuel characteristics (e.g., BTU per SCF, flame speed, hydrogen content, etc.), changes in atmospheric conditions, and the like. Inasmuch as open loop control does not use any feedback, the degree of air-fuel ratio "optimization" is left to the vagaries of system calibration drift, mechanical mixing limitations of the carburetor itself, mechanical degradation and changes in combustion variables such as ambient air conditions and changes in fuel characteristics. Maintaining an acceptable degree of air-fuel ratio optimization requires routine maintenance and calibration, which can become costly and invasive. In addition, there are reliability concerns. In particular, the engine can operate at air-fuel ratios rich of the lean power loss/misfire limit, but cannot operate at all at air-fuel ratios lean of the lean power loss/misfire limit. Therefore, when variations, due to the above factors, occur tending to lean the already predetermined "lean" air-fuel ratio provided to the engine, drastic drop offs of power output may be observed, with operation of the engine becoming erratic. In the worst case scenario, the engine may stop operating all together. Inasmuch as this situation is commercially unacceptable, the air-fuel ratio adjustment is configured so as to leave the air-fuel ratio richer than an optimal "lean" air-fuel ratio by a predetermined guard or safety margin. This safety margin is to allow for the above-described degradation in air-fuel control that could result in air-fuel ratios lean of the lean power loss/misfire limit being provided to the engine. The disadvantage of including this guard or safety margin is an increase in fuel consumption, which thereby directly increases CO.sub.2 emissions, as well as elevates combustion temperatures (which increases NO.sub.x. Known open loop control strategies have thus been found unsatisfactory in the foregoing respects.

BSPR:
Known closed loop control strategies have similar disadvantages. In known closed loop systems of the type including, for example, a carburetor, a sensor (e.g., such as an exhaust oxygen sensor or an exhaust temperature sensor) is used. The sensor provides a sensed variable signal that is indicative of the combustion process. The sensed variable signal is used in the control strategy to adjust the air-fuel ratio of the charge provided to the engine. However, one disadvantage of such a system is that the control of the air-fuel ratio can only be as accurate as the sensor output itself. Second, while such a sensor does measure a combustion-related event, it does not directly measure lean power loss/misfire, per se. A third disadvantage involves the fact that this approach is unable to detect (and thus track) factors such as ambient atmospheric changes, changes in fuel characteristics or traits (e.g., BTU per SCF, flame speed, hydrogen content, etc.), and sensor degradation/drift. A fourth disadvantage involves the fact that such sensor-based systems require regular calibration and maintenance checks, which increases maintenance costs. A fifth disadvantage is that such systems have an undesirable failure mode (i.e., sensors may fail in an undesirable fashion,

rendering the engine inoperative). Sixth, as the engine itself changes with condition (e.g., wear), desired target values change (to which the system is controlled using the sensor output) and failure to make ongoing compensation to the predetermined "target" values will cause the controlled air-fuel ratio to deviate from the programmed optimum.

DEPR:
Another advantage of control system 10 is that inasmuch as the engine operating envelope must be defined (e.g., both the speed and torque of the engine are known) for the control to be imposed, the emissions from the engine may be determined, for example, via the methodology described and claimed in U.S. Pat. No. 5,703,777 entitled "Parametric Emissions Monitoring System Having Operating Condition Deviation Feedback." This provides benefits to users of such engines who must know emissions for record keeping or to ensure emission permit compliance. If the engine health degrades appreciably, operation may become unstable, which may in turn cause an alert to be asserted whereby the operator or control system may take remedial action.

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L2: Entry 3 of 36 File: USPT Jan 9, 2001

DOCUMENT-IDENTIFIER: US 6170742 B1
TITLE: Method for using a smart card for recording operations, service and maintenance transactions and determining compliance of regulatory and other scheduled events

DEPR:
Events such as 1030 may involve parts such as 1060 in the transaction. Parts are hardware, material or software objects that could be removed, modified or replaced to maintain, enhance or operate the machine. The following are attributes of the part 1060 entity: the serial number which is a unique identifier of a part, the name 1062 of a part, the name of the manufacturer 1063, the cost 1064 of the part, and the warranty on the part 1065. Events such as regulation compliance or warranty/insurance require recording, retrieving, and processing information that is specific to the event; these are addressed in the event delineation 1130 entity. This entity describes, for example, information on the inclusion or exclusion of a warranty/insurance event, or in the case of a regulation event, this entity captures information on compliance with certain regulation acts. An event may have multiple event delineations 1130. An event delineation can be regulated or controlled by an individual/organization such as 1110. An individual/organization 1110 can control or regulate multiple event delineations.

DEPR:
Airplanes and helicopters often require high cost maintenance and repair, and are subject to frequent operational and service transactions. Current record keeping of these transactions is managed on paper forms or electronic databases. For the owner of a small plane, a smart airplane card is more convenient and allows transparent record keeping and easy information retrieval. A method of operation similar to that described in FIG. 27 can readily be adapted by airplanes and helicopters.

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L2: Entry 4 of 36 File: USPT May 23, 2000

DOCUMENT-IDENTIFIER: US 6067549 A
TITLE: System for managing regulated entities

DEPR:
The primary advantage of storing requirement statements as data fields rather than text passages is that a software routine can easily extract from the record the data that specifies a number or a date with which compliance is required and then electronically compare that data to other data representing the actual observed or reported situation. For example, a pollutant emission limit stated in a permit requirement can be machine-compared to pollution monitoring data obtained later to determine whether the parameter is within the allowable range. Similarly, the system can compare a due date for an action required of the permittee, such as submitting a quarterly report, to data entered later recording the receipt date of such items to determine whether the obligation was satisfied on time. These automated capabilities significantly reduce the amount of time that agency personnel must devote to compliance determination, one of the primary tasks of a regulatory agency.

CLPV:
wherein said maintaining of the requirements library includes maintaining checklist language corresponding to the requirements for operation of the subject items, and

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L2: Entry 9 of 36 File: USPT Sep 7, 1999

DOCUMENT-IDENTIFIER: US 5950150 A
TITLE: Fire/life safety system operation criteria compliance verification system and method

BSPR:
Applicable standards/codes include, but are not limited to: NFPA Standard 13, which in simplified terms regulates (installation of) sprinkler systems; NFPA Standard 14, which in simplified terms regulates (installation of) standpipe and hose systems; NFPA Standard 20, which in simplified terms regulates (installation of) fire pumps; and NFPA Standard 25 which in simplified terms regulates the testing and maintenance of water-based fire protection systems. Full compliance with these standards/codes is paramount to ensure that in the event of a fire, water-based fire protection systems perform as designed. Adherence to NFPA Standard 25 is most critical since it pertains to routine testing and maintenance requirements that help ensure the successful automatic operation of a water-based fire protection system.

BSPR:
These testing and maintenance requirements as set forth in NFPA Standard 25, and elsewhere, are to be conducted weekly, monthly, quarterly or annually depending on the pertinent code. In simplified terms, the applicable NFPA Standard 25 codes are as follows:

BSPR:
The problem with this scenario is that it assumes that a qualified person is present to conduct the required inspections, when in fact, maintenance personnel do not have to be present for the automatic start and stop sequence to occur. Just because the diesel engine started and stopped automatically does not mean that a valid inspection was conducted nor that the fire pump system is code compliant. Although the pump may be started and stopped automatically by the fire pump controller, the controller has no capability to verify code compliance nor is it required by NFPA standards/codes to do so.

BSPR:
The wide variety of sprinkler systems likewise have their own unique test, inspection, and maintenance requirements as set forth in NFPA Standard 25 and others. While these requirements differ from those of fire pumps, the difficulty in ensuring system code compliance does not. Since there are far more sprinkler systems than fire pump systems, perhaps by a ratio of at least 10 to 1, the need to verify code compliance of these systems is likewise amplified.

BSPR:
Sprinkler system test, inspection, and maintenance requirements are as diverse as the systems themselves. Requirements vary depending on system type, but can be generalized in simplified terms to include, but not be limited to: testing of flow switches, tamper switches, pressure switches, and alarm devices; and inspection of water levels, water temperature, valve-room temperatures, control valves, alarm valves, deluge valves, dry pipe valves, air pressure maintenance devices, foam supply levels, and proportioning systems. In general, these requirements shall be met by qualified personnel activating the system or simulating an activation via by-pass or test stations, and by direct visual or mechanical inspection.

BSPR:
Fire detection/alarm system test, inspection, and maintenance requirements are as diverse as the systems themselves. These requirements vary depending on system

configuration and integration to any water-based fire protection or life safety system, but based upon, but not limited to, NFPA 70, 71 and 72 (D,E,G,H, et al) can be generalized in simplified terms to include, but not be limited to: periodic (daily, weekly, monthly, quarterly, semi-annually, annually, depending on the specific code requirement) testing of smoke detectors, heat detectors, and pull stations; testing of flow switch signal, tamper switch signal, fire pump signal reception/activation; testing of alarm notification devices; and testing of central station service. In general, these requirements shall be met by qualified personnel activating the requisite system components or simulating an activation via test methods, and by direct visual or mechanical inspection.

BSPR:
Life safety system test, inspection, and maintenance requirements vary depending on system configuration and integration to any water-based fire protection and/or fire detection/alarm system, and based upon, but not limited to, NFPA 70, 71 and 72 can be generalized in simplified terms to include, but not be limited to: periodic (daily, weekly, monthly, quarterly, semi-annually, annually, depending on the specific code requirement) testing of smoke evacuation, smoke pressurization, HVAC shutdown, elevator recall, and fire door close/open systems when the FACP is in the "alarm condition". The general test determination being, did these systems function properly when the FACP was in the "alarm condition"? For example, did the elevator recall system send all the elevators to the main (exit) level when the FACP went into the "alarm condition"? For the crossover to emergency (back-up) power system, tests include but are not limited to: Did the system provide emergency (back-up) power to essential circuits? Did the emergency generator start in the required time? Since these life safety systems perform a vital function in preventing the loss of life, there is need to verify their code compliance, which will help ensure that these systems are kept in a state of known operational readiness, thus improving their reliability and performance.

BSPR:
According to another aspect of the invention, a method of verifying operational criteria compliance of a fire/life safety system or component thereof is achieved by sensing one or more parameters pertinent to operational criteria compliance verification of one or more components of the fire/life safety system, recording and date/time stamping data relating to such parameters, verifying operational criteria compliance based on such recorded data and predetermined operational criteria, and generating an operational criteria compliance verification report based on the sensed data. Additionally, the invention can further forward the operational criteria compliance verification report to one or more predetermined entities, such as an insurance carrier, building/structure owner, or property management firm, notify in real-time such predetermined entities of problem conditions, and can archive the recorded data and report for long term statistical analysis.

DEPR:
As previously discussed, these reports may be manually forwarded by mail and/or manually, semi-automatically or automatically forwarded electronically by E-mail, facsimile or other electronic transfer. However in its most elemental form, the report method could be a red/green light combination of the system site; green indicating compliance, red non-compliance and a method for extracting data from the recorder showing compliance.

CLPV:
accessing said historic record data and verifying operational criteria compliance based on said historic record data and a predetermined operational criteria; and

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starting with:

RECORD$(RECORDING-TRANSMITTING).P28-P85,P87-P87,P23-P27,P20-P22,P1-P18.

Search Results -

Terms	Documents
(compliance near5 record$) and (requir$ near3 (maintenance or maintain$))	36

Database:

US Patents Full-Text Database
US Pre-Grant Publication Full-Text Database
JPO Abstracts Database
EPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Refine Search: (compliance near5 record$) and (requir$ near3 (maintenance or maintain$)) Clear

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DB Name	Query	Hit Count	Set Name
USPT,PGPB,JPAB,EPAB,DWPI	(compliance near5 record$) and (requir$ near3 (maintenance or maintain$))	36	L2
USPT,PGPB,JPAB,EPAB,DWPI	((job adj1 card$) and (requir$ near3 (maintenance or maintain$)))	4	L1